



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,602	07/05/2005	Hong-Sick Park	8071-152T	7109

7590 05/30/2008
F. Chau & Associates, LLC
130 Woodbury Road
Woodbury, NY 11797

EXAMINER

MULPURI, SAVITRI

ART UNIT	PAPER NUMBER
----------	--------------

2812

MAIL DATE	DELIVERY MODE
-----------	---------------

05/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/516,602	PARK ET AL.	
	Examiner	Art Unit	
	Savitri Mulpuri	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/31/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-39 is/are pending in the application.
- 4a) Of the above claim(s) 36-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/31/2008 has been entered.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 27-35, drawn to method, classified in class 438, subclass 584.
- II. Claims 36-39, drawn to product, classified in class 257, subclass 3 65.

During a telephone conversation with Mr.Applebaum on 5/27/2008 a provisional election was made without traverse to prosecute the invention of I, claims 27-35. Affirmation of this election must be made by applicant in replying to this Office action. Claims 36-39 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the claimed product

Art Unit: 2812

can be formed by a photolithography process as disclosed in the Admitted prior art (page 1, line 24-30) as alternative to instant claimed process.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

Art Unit: 2812

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 27-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chae (US 6,919,931) in combination with Kelly et al (US 6,524,663) or Kudas et al (US 2003/0124259A) and Qian(US 6,365,968).

Chae teaches a method of manufacturing and a thin film transistor device for array panel, the method comprising:

Forming a gate wire on an insulating substrate "22", the gate wire including a gate line "13", a gate electrode"26", and a gate pad"41";

With respect to claims 4-9, sequentially depositing a gate insulating layer ""51", amorphous silicon layer "53", and ohmic contact layer"55" on the gate wire;

Patterning the ohmic contact layer and the amorphous layer by photolithography;

Forming a data wire on the ohmic contact layer, and the adapt wire including source and drain electrodes "28, 30", a data line "15", data pad (not shown);

forming a protective layer "57" on the data wire, the protective layer having a first contact hole "59" exposing the drain electrode, a second contact hole

Art Unit: 2812

exposing the gate pad "61" and a third contact hole exposing the data pad (not shown) and;

forming pixel electrode "17", a subsidiary gate pad or transparent pad electrode "43" on gate pad "41", add subsidiary data pad or transparent pad electrode (not shown) on data pad on the protective layer, the pixel electrode being connected to the drain electrode through first contact hole, the subsidiary gate pad being connected to the gate pad through the second contact hole, the subsidiary data pad being connected to the data pad through the third contact hole (see fig 22, 3 4A-5 and related description).

With respect to claim 9 Chae also teaches forming protective layer with prominent and depressed portions

Chae does not teach forming an organometallic layer by coating a photosensitive organometallic complex; placing a photomask over the organometallic layer such that a predetermined region of the organometallic is exposed; exposing the organometallic layer to the light through a photomask; and developing the organometallic layer.

Kelly et al teaches a method of forming a metal pattern for integrated circuits comprising: forming an organometallic layer by coating a photosensitive organometallic complex; exposing the organometallic layer to light through a photomask; and forming a metal pattern by developing the organometallic layer (see abstract and col 1, lines 46-54). Kelly further teaches making integrated circuits by forming metallization by using organic metal compounds, wherein metals includes Cu Ni, gold, or any other suitable metals (see col. 8,

Art Unit: 2812

lines 47-50; col. 9, lines 46-49 It would have been obvious to one of ordinary skill in the art to form metal pattern in the invention of Chae by forming organometallic layer by coating a photosensitive organometallic complex and exposing the organometallic layer to light through photomask and developing and forming a metal pattern by developing the organometallic layer because such process is electroless plating and gives good quality result and metal pattern can be formed on the insulator or on the semiconductor or on the conductors(see col. 1, lines 35-45).(see fig. 2, -4 and related description).

With respect to claims 34 neither Chae nor Kelly teaches organic material containing silver.

Kodas et al (US 2003/0124259A). teaches metal organic precursor composition containing UV sensitive organic ligand by using organic metallic complex containing silver or aluminum to form metal as a contact on semiconductor materials(see para 0023,para 0049,para0058). Kodas et al also discloses ultraviolet irradiation by using photo mask to form metal pattern (para 0168). It would have been obvious to one of ordinary skill in the art to form silver or Al metal pattern in the invention of modified invention Chae because Kelly gives a choice of using any other suitable metals alternative disclosed materials such Pd, Pt Ag.

Clearly both Kelly and Kodas (para0168) teach, "The development of organometallic layer is made by way of organic solvent".

Kelly teaches organometallic compound is either in liquid state or solid state to form metal pattern for integrated circuits by coating a photosensitive

Art Unit: 2812

organometallic complex; exposing the organometallic layer to light through a photomask; and forming a metal pattern by developing the organometallic layer(see abstract and col1, lines 46-54). Kelly further teaches making integrated circuits by forming metallization by using organic metal compounds, wherein metals includes Cu Ni, gold , or any other suitable metals (see col. 8, lines 47-50; col. 9, lines 46-49 . Kodas teaches organometallic compound is as organic solvent. It would have been obvious to one of ordinary skill in the art to use organic metallic compound as a liquid or solid state because both forms are suitable to form metal pattern for integrated circuits as taught by Kelly et al or Kodas.

None of the above references teach embossing surface. Qian teaches forming embossing surface on the protection layer “118” by using a photoresist with variable thickness and then followed by oxide metal layer (abstract and col.2, lines 34-47). It would have been obvious to one of ordinary skill the art to form embossing surface in the modified invention invention of Chae because embossing the surface by suing photoresist with variable thickness would give good adhesion between embossed layer and the subsequently deposited layer.

Response to Arguments

Applicant's arguments filed 3/31/2008 have been fully considered but they are not persuasive. Applicant argues that Chae fails to teach or suggest a method which includes utilizing an organometallic layer which when developed

Art Unit: 2812

after being exposed to light through a photomask directly forms a final metal pattern, as recited in the new claim 27 or a method in claim 30 and 31.

Applicant argues that Kelly fails to teach or suggest a method which includes utilizing an organometallic layer which when developed after being exposed to light through a photomask directly forms a final metal pattern, as recited in the new claim 27 or a method in claim 30 and 31. In contrast Kelly describes a method of forming a metal by using an organometallic compound. However, the direct product made by organometallic is only a surface activation i.e., a seed film for electroless plating. Thus Kelly requires that additional steps, such as electroless plating be performed on the surface activation film before final metal film is formed which can be used for wires, etc, as disclosed in abstract col.1, lines 46-55). . Accordingly the surface activation film formed in Kelly is clearly is not a final metal film as required by claim 27 nor the surface activation film of Kelly be used for gate wires, data wires or pixel electrodes As required by claims 30, 31. Rather, in Kelly, final product a final pattern of final metal film used for wires is formed by subsequent step of electroless plating on the surface activation film. However, Kelly uses the same technique as claimed of forming organ metallic layer by coating photosensitive organometallic complex, placing a photomask over the organometallic layer such that a predetermined pattern organometallic layer is exposed, exposing the organometallic layer to light through photomask, and developing the organometallic layer. Though Kelly

Art Unit: 2812

teaches thin metal film as seed layer Kodas teaches the same technique to form the metal line without subsequent electroless deposition.(para 0168)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 a.m. to 4.30 p.m...

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber, can be reached on 571-272-2194. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Savitri Mulpuri/

Art Unit: 2812

Primary Examiner, Art Unit 2812